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(54) GAS TURBINE STATIONARY BLADE

(57) Abstract:

PROBLEM TO BE SOLVED: To prevent the largest crack which may result in damage from growing and to provide a longer-life gas turbine stationary blade, by arranging plural ellipsoidal holes and slits which have a major axis in the direction perpendicular with principal stress in a high stress generating region.

SOLUTION: In a high stress generating region 2 in a gas turbine stationary blade 1 which is exposed to combustion gas from a combustor and receives damage from thermal fatigue and creep generated, principal stress is generated in the arrow 3 direction, and cracks extend in the direction perpendicular to this principal stress. The direction of the principal stress is estimated from structural analysis in a finite-element method or others and from examples of cracks generated in the past. Therefore, plural ellipsoidal holes 4 are arranged around the periphery of the high stress-

generating region 2 which is expected to be a starting point so that plural micro-cracks are produced previously. These ellipsoidal holes 4 are provided by electric discharge machining and laser beam machining. When there are plural cracks, by decreasing the ratio distance between cracks to crack length and decreasing stress extension factor, growth of cracks is restrained, extension of each crack is prevented, and a maximum length of crack is minimized.

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